

Pseudo aneurysm in an artery following a stab wound

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Abstract: This is a case report of a 23 year old male who was stabbed in his left ear close to his left temporal artery resulting in him suffering a haematoma [1,2]. The nature of the diagnosis, aetiology, treatment, patient management and the radiographic appearances of a haematoma and aneurysm following a stabbing incident are discussed.

Keywords: Haematoma, left temporal artery, computed tomography, angiography, interventional coil embolization

Case report

A 23 year old man presented with a stab wound in his left ear. He had no previous medical or surgical history as well as no known allergies. On presentation, both pupils were equal and reactive; his abdomen was soft and tender. The preliminary diagnosis was a possible fracture of the left temporal bone including a large haematoma and/or an aneurysm in the left internal maxillary artery (LIMA).

Upon admission he was referred for a computed tomography (CT) of his brain which revealed no intracranial pathology. He was then referred for an angiogram of the head and neck vessels which demonstrated an aneurysm in the left internal maxillary artery (see Figures 1 and 2). The angiogram revealed a large lobulated false aneurysm, measuring 47 x 17 mm, which arose from the left internal maxillary artery at the corner of the mandible. No arteriovenous malformation (AVM) was noted. However there was compression of the left internal carotid artery. A decision was made by the radiologist to embolize the aneurysm. Coil embolization was performed using a five French sheath catheter which was passed into the right femoral artery using water soluble contrast media. The catheter was passed to the left external carotid artery. A 4f10 stranded and 4f6 coils were used to embolize the aneurysm. The procedure was successful as it showed thrombosis of the left internal maxillary artery post-embolization (see Figure 3). The patient was given antibiotics to prevent any infections and kept in the ward for observation.

Discussion

In this particular case, the haematoma was caused by a stab to the left ear which resulted in a false aneurysm. A false aneurysm is also called a pseudo aneurysm; a localized dilation of a blood vessel, usually an artery, caused by a traumatic perforation of the walls of the vessel [3]. Blood leaks into the surrounding tissue causing the build-up haematoma. Blood pressures inside and outside of the vessel stabilize and allow pooling of blood inside the haematoma which causes pulsation. Communication between a vein and an artery within a false aneurysm is called an arteriovenous fistula [2].

False aneurysms which result from trauma often present with a pulsating haematoma. The nature of this kind of aneurysm results from a small perforation in the wall of an artery. The aetiology is caused by trauma from sharp instruments. The small aperture of a false aneurysm is sufficiently large to permit the escape of blood into the surrounding tissues where it collects until the pressure within the haematoma approaches that of the blood pressure. At this stage the haematoma no longer enlarges as the blood re-enters the artery in diastole and refills in systole resulting in a 'to and fro' murmur [4].

The force which expands an aneurysm is the blood pressure, but for an aneurysm to form there has to be local weakening of the media which stretches. Stretching results in further weakening so that once the aneurysm has formed it tends to expand and then most often ruptures [5].



Figure 1. Digital subtraction angiogram (DSA) PA view of the left internal maxillary artery. There is a large lobulated false aneurysm arising from the left internal maxillary artery (see arrow).



Figure 2. Lateral DSA of the left external carotid artery demonstrating a false aneurysm in the left internal maxillary artery with pooling of water soluble contrast media (see arrow).



Figure 3. PA DSA view of left internal maxillary artery with coils showing embolization of the aneurysm (see arrow).

A haematoma must communicate with the diseased artery to be considered a pseudo aneurysm. A pseudo aneurysm differs from a true aneurysm in that the former does not contain any of the vessel wall [6]. The epidemiology of a false aneurysm occurs in all ages of both sexes. The aetiology is most often caused by direct penetrating injury such as trauma.

Treatment and patient management varies according to the severity of the aneurysm; an aneurysm may continue to expand if not treated correctly. Treatment options are endovascular such as insertion of stents, embolization of coils or surgical treatment.

The general radiological appearances and findings of an aneurysm are an irregular or lobulated arterial outpuching of a vessel which can vary in size. There is usually a focal haematoma adjacent to the vessel. Angiographic findings demonstrate contrast slowly fills the vessel with avascular mass effect [6]. Coil embolization is a catheter-based procedure that allows precise occlusion of abnormal blood flow in a blood vessel. A catheter with a metallic occluding coil is inserted into an artery, usually the femoral artery. It is then advanced to the abnormal blood vessel. Once the catheter is in the vessel, the metal coil is released, springing into position within the vessel. It remains firmly in place by the expansion of the metal coils. A blood clot will form on the coil, obstructing the abnormal blood flow beyond the coil which will create a permanent seal. Interventional coil embolization usually takes 1 to 3 hours [7].

Conclusion

Pseudo aneurysms are usually treated by embolization of the affected vessel. In this case the patient was successfully treated by interventional coil embolization in the left internal

maxillary artery, after he was diagnosed with a pseudo aneurysm of the left internal maxillary artery following a stab to the left ear. The patient was discharged in a stable condition two weeks after the coil embolization.

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